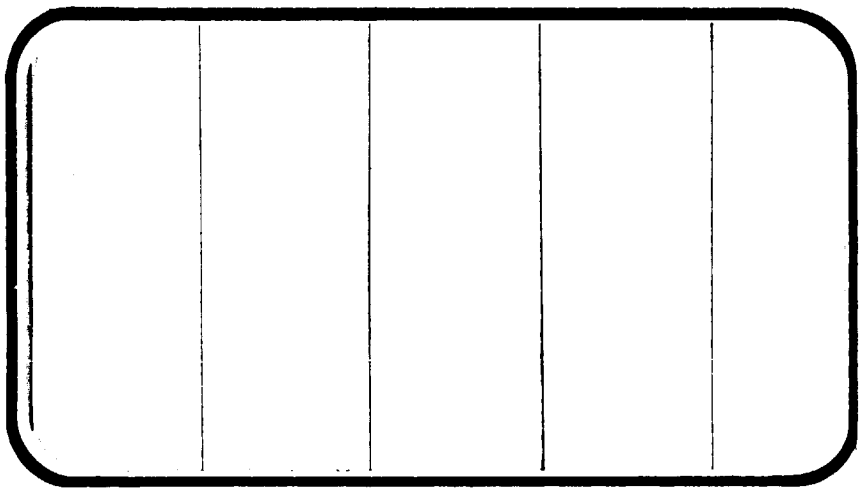
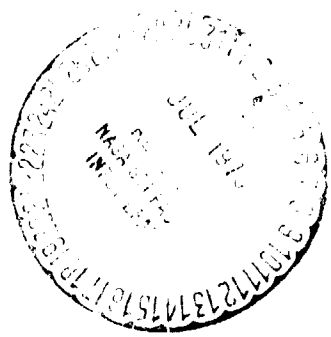
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA CR-
141535





SPACE SHUTTLE

AEROTHERMODYNAMIC DATA REPORT

JOHNSON SPACE CENTER

HOUSTON, TEXAS

DATA MANagement services

SPACE DIVISION CHRYSLER CORPORATION

May, 1975

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NASA CR-141,535

RESULTS OF DYNAMIC STABILITY TESTS CONDUCTED ON A .012 SCALE MODEL MODIFIED 089 B SHUTTLE ORBITER IN THE AEDC-VKF TUNNEL B AT A MACH NUMBER OF 8.0 (LA42)

Prepared Under NASA Contract Number NAS9-13247

by

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for

Engineering Analysis Division

Johnson Space Center
National Aeronautics and Space Administration
Houston, Texas

WIND TUNNEL TEST SPECIFICS:

Test Number:	AEDC V41B-48A
NASA Series Number:	LA42
Model Number:	LaRC Modified 089B Orbiter
Test Dates:	June 25 and July 27, 1974
Occupancy Hours:	20

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ABSTRACT

Experimental aerodynamic investigations were conducted during June and July 1974 on a .012 scale model of a NASA/Langley modified version of the Rockwell 089B Space Shuttle Orbiter. The modification consisted of using the 139 B orbiter nose forward of station 500 on the 089 B fuselage. Using the forced oscillation test technique, dynamic stability derivatives were measured in the pitch, yaw and roll planes at a Mach number of 8 over an angle of attack range from -4^{o} to 28^{o}. Plotted and tabulated results are presented herein.

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Schedule of Coefficients Plotted:

A) CLMALF, CLMQ vs ALPHA

B) CBLBTA, CBLP vs ALPHA

C) CYNBTA, CYNR vs ALPHA

NOMENCLATURE

SYMBOL	PLOT SYMBOL	DEFINITION
b	BREF	reference length for lateral coefficients, (wing span) inches
$(C_{\ell_\beta} \sin \alpha)$	CBLBTA	$\partial C_\ell / \partial \beta$, per radian
$(C_{\ell_p} + C_{\ell_{\dot\beta}} \sin\alpha)$	CBLP	roll-damping coefficient, $\partial C_\ell / \partial (pb/2V_\infty)$ + $\partial C_\ell / \partial (\dot\beta b/2 V_\infty) \sin \alpha$, per radian
C_m	CLM	pitching moment coefficient
C_{m_α}	CLMALF	slope of pitching-moment vs angle of attack curve, per radian
$(C_{m_q} + C_{m_{\dot\alpha}})$	CLMQ	damping-in-pitch derivatives, $\partial C_m / \partial (q\bar{c}/2V_\infty) + \partial C_m / \partial (\dot\alpha \bar{c}/2V_\infty)$, per radian
C_n	CYN	yawing moment coefficient
C_{n_β}	CYNBTA	slope of yawing moment vs angle of sideslip curve, per radian
$(C_{n_p} + C_{n_{\dot\beta}} \sin \alpha)$	CYNP	yawing moment coefficient due to roll rate $\partial C_n / \partial (pb/2V_\infty) + \partial C_n / \partial (\dot\beta b/2V_\infty) \sin \alpha$, per radian
$(C_{n_r} - C_{n_{\dot\beta}})$	CYNR	damping-in-yaw derivative, $\partial C_n / \partial (rb/2V_\infty) - \partial C_n / \partial (\dot\beta b/2V_\infty)$, per radian
$\bar{c}$	LREF	reference length for longitudinal coefficients (wing mean aerodynamic chord) inches
p	-	roll velocity, radians/sec
q		pitch velocity, radian/sec
q_∞	Q(PSF)	freestream dynamic pressure, psf
r		yaw velocity, radians/sec
R_N	RN	Reynolds number based on model length
S_{REF}	SREF	reference area, (wing planform area) ft^2
V_∞	-	freestream velocity, ft/sec

NOMENCLATURE (Concluded)

SYMBOL	PLOT SYMBOL	DEFINITION	
$X_{c.g.}$	XMRP	longitudinal	location of pivot axis (moment reference point) (theoretical c.g.)
$Y_{c.g.}$	YMRP	lateral	
$Z_{c.g.}$	ZMRP	vertical	
α	ALPHA	angle of attack, degrees	
β	BETA	angle of sideslip, degrees	

NOTE: dot over symbol (i.e., $\dot{\alpha}$) denotes time rate of change of the symbol.

CONFIGURATIONS INVESTIGATED

An 0.012 scale model of the Rockwell 089 B orbiter modified forward of fuselage station 500 to the 139 B orbiter configuration was tested with and without the vertical tail in the yaw and roll modes and in the full configuration only in the pitch mode. Figure 2 depicts the configuration tested which included the OMS pods but not the body flap. Table I gives the tunnel conditions existing during the test while Table II delineates the configurations investigated at specific conditions. Table III lists pertinent dimensional information about each model component tested.

TEST MECHANISM

PITCH/YAW

The pitch/yaw damping test mechanism (Reference 1) utilizes a cross flexure pivot, an electric shaker motor and a one-component moment beam which is instrumented with strain gages to measure the forcing moment of the shaker motor, Figure 3a. The motor is coupled to the moment beam by means of a connecting rod and flexural linkage which converts the translational force to a moment (70 in.-lb maximum) to oscillate the model at amplitudes up to ± 3 deg (depending on flexure balance) and frequencies from 2 to 20 Hz. The cross flexures, which are instrumented to measure the pitch/yaw displacement, support the model loads and provide the restoring moment to cancel the inertia moment when the system is operating at its natural frequency. Presently, two cross flexure balances exist and each is composed of three beams with single unit construction. The beam thickness for each balance is 0.087 and 0.17 in. and the restoring moment produced by each balance is -132 and -938 ft-lb/radian, respectively. Since the moment beam which is used to measure the forcing moment is not subjected to the static loads, it can be made as sensitive as required for the dynamic measurements. Beams exist which can measure up to ± 0.6, ± 3, ± 11, ± 25, and ± 70 in.-lb. A pneumatic- and spring-operated locking device is provided to hold the model during injection into or retraction from the tunnel or during tunnel starts. The cross-flexure balances can be supported by an elliptical cross-section sting

(provides support strength and maximum model clearance but is not water-cooled) or a 1.75-in.-dia. water-cooled sting (normally used with the roll-damping balance, Reference 2). The water-cooled sting was used during the present tests in conjunction with the -132 ft-lb/radian cross-flexure balance and primarily the ±3 in.-lb. moment beam.

ROLL

The roll-damping test mechanism (Reference 2) utilizes a water-jacketed, five-component balance, twin beam flexures, roller bearings to support the loads, and electric printed-circuit drive motors, Figures 3b and 3c. The motors are directly coupled to the balance and supply up to 120 in.-lb roll moment to oscillate the system at amplitudes up to ±3 deg and at frequencies from 2 to 20 Hz. The twin beam flexures mount from the stationary sting to the oscillating water jacket and provide a restoring moment which cancels the inertia moment when the system is operating at the natural frequency of the model-flexure system. The flexures are instrumented to measure the roll displacement. The entire mechanism is water-cooled to permit testing in the hypersonic tunnels.

Two five-component balances have been fabricated for the system to provide good balance sensitivity over the load range. Both balances utilize outrigger beams in the yaw sections and thin-ribbed flexures in the roll section to provide sensitive yaw and roll outputs while maintaining large normal-force capacity and rigidity in yaw. Semiconductor gages are also utilized for the yaw and roll sections for additional sensitivity. The -59 balance was used during the present test.

TEST INSTRUMENTATION

The forced oscillation instrumentation (Reference 1 and 2) utilizes an electronic analog system with precision electronics. The control, monitor, and data acquisition instrumentation is contained in a portable console that can be easily interfaced with the instrumentation of the various wind tunnels.

The control instrumentation provides a system which can vary the oscillation frequency, oscillation amplitude, and angular position of the model within the flexure limits (for both pitch, yaw and roll tests). The oscillation amplitude is controlled by an electronic feedback loop which permits testing both dynamically stable and unstable configurations.

Data are normally obtained at or near the natural frequency of the model-flexure system; however, the electronic resolvers used permit data to be obtained off resonance. The gages on the balances are excited by d-c voltages, and outputs are increased to optimum values by d-c amplifiers. Typical balance outputs from an oscillating model are composed of oscillatory components (OC) superimposed on static components (SC). These components are separated in the data system by bandpass and lowpass filters. The SC outputs are sent directly to the tunnel scanner and computer, which for the pitch/yaw tests calculate the static moment coefficients and sting deflections and for the roll test calculate the static-force and moment coefficients. The OC outputs are input to the resolver instrumentation and the precise frequency-measuring instrument which were

developed at VKF. The resolvers utilize very accurate analog electronic devices to process the OC signals and output d-c voltages, which for the pitch/yaw tests are proportional to the amplitude squared, the in-phase and quadrature balance components, and the in-phase and quadrature sting components and for the roll tests are proportional to the amplitude squared, the in-phase and quadrature (90 deg out of phase) moments, and the quadrature yawing moments. A switch is also provided in the resolver system to bypass the phase shift network so that the in-phase yawing moments can be determined during the roll tests. The resolver and frequency outputs are read by the tunnel scanner and sent to the computer. The frequency instrument controls the length of the data interval in increments from approximately 2 to 60 seconds, during which time the scanner reads each input approximately 10 times per second. The average values of the readings are calculated by the computer, which then uses these average values to calculate the dynamic coefficients.

TEST FACILITY DESCRIPTION

The AEDC-VKF Tunnel B is a continuous, closed-circuit, variable density wind tunnel with an axisymmetric countoured nozzle and a 50-in. diameter test section. The tunnel can be operated at a nominal Mach number of 6 or 8 at stagnation pressures from 20 to 300 and 50 to 900 psia, respectively, at stagnation temperatures up to 1350°R. The model may be injected into the tunnel for a test run and then retracted for model cooling or model changes without interrupting the tunnel flow. A description of the tunnel may be found in Reference 3. A tunnel depiction is given in Figure 3d.

REFERENCES

1. Burt, G.E. "A Description of a Pitch/Yaw Dynamic Stability Forced-Oscillation Test Mechanism for Testing Lifting Configurations", AEDC-TR-73-60.

2. Burt, G. E. "A Description of a Forced-Oscillation Test Mechanism for Measuring Dynamic-Stability Derivatives in Roll", AEDC-TR-73-49.

3. Test Facilities Handbook (Tenth Edition) - von Karman Gas Dynamics Facility, Volume 3, AEDC, May 1974.

TABLE I

TEST : AEDC V 41 B - 48 A

DATE : 7/28/74

TEST CONDITIONS

MACH NUMBER	REYNOLDS NUMBER	STAGNATION PRESSURE (pounds/sq. inch)	STAGNATION TEMPERATURE (degrees Rankine)
8.0	1.18	200	850
8.0	2.36	400	850
8.0	4.75	850	886

BALANCE UTILIZED: See Text (Test Mechanism)

	CAPACITY:	ACCURACY:	COEFFICIENT TOLERANCE:
NF			
SF			
AF			
PM			
RM			
YM			

COMMENTS:

TABLE II

TEST : AEDC V41B-48A (LA-42) | DATA SET/RUN NUMBER COLLATION SUMMARY | DATE : 10/10/74

DATA SET IDENTIFIER	CONFIGURATION	SCHD. α	SCHD. β	PARAMETERS/VALUES RE,L	NO. OF RUNS	MACH NUMBERS 8.0	TEST RUN NUMBERS
RTPP01	BWV	B	0	1.18		1	
02	↓	A	0	2.36		2	
03	↓	A	0	4.82		3	
RTPY02	BWV	A	0	2.37		4	
04	BW	A	0	2.37		5	
RTPR01	BWV	A	0	1.19		6	
02	↓	A	0	2.35		10	
03	↓	A	0	4.72		9	
04	BW	A	0	2.34		7	
05	↓	A	0	4.74		8	

1 CLMQ 7 CLMALF 13 CYNBTA 19 25 31 37 43 49 55 61 67 75 76

CBLP RBLBTACYNP CYP CN CLM CY CYN CBL CYNR MACH ALPHA 1.0

α OR β SCHEDULES: A = -3° → 25° Δα = 2°; B = -3° → 7°

COEFFICENTS

IDVAR (1) IDVAR (2) NDV

TABLE III.

MODEL DIMENSIONAL DATA

MODEL COMPONENT : BODY - 089B-139B (Modified Nose)

GENERAL DESCRIPTION : Nose section from full-scale station 238.0 to STA. 500 from NAR drawing VL70-000139B. Remaining body AFT of STA 500 from NAR drawing VL70-000093.

DRAWING NUMBER : VL70-000093

DIMENSIONS : (inches)	FULL SCALE	.012 MODEL SCALE
Length	1290.3	15.484
Max Width	265.0	3.180
Max Depth	248.0	2.976
Fineness Ratio	4.869	4.869
Area		
Max. Cross-Sectional (ft^2)	456.40	.0657
Planform		
Wetted		
Base		

TABLE III. (CONTINUED)

MODEL COMPONENT: ELEVON

GENERAL DESCRIPTION: CONFIGURATION PER LINES VL70-000093

DATA FOR (1) OF (2) SIDES

MODEL SCALE = 0.012

DRAWING NUMBER: VL70-000093

DIMENSIONS: (inches)	FULL-SCALE	.012 MODEL SCALE
Area (ft^2)	205.517	.02959
Span (equivalent)	353.34	4.24
Inb'd equivalent chord	114.78	1.377
Outb'd equivalent chord	55.00	.66
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	.208	.208
At Outb'd equiv. chord	.400	.400
Sweep Back Angles, degrees		
Leading Edge	0.00	0.00
Tailing Edge	-10. 02	-10.02
Hingeline	0.00	0.00
Area Moment (Normal to hinge line)-Ft^3	1548.07	.00267

TABLE III. (CONTINUED)

MODEL COMPONENT: RUDDER

GENERAL DESCRIPTION: CONFIGURATION PER LINES VL 70-000095

SCALE MODEL = .012

DRAWING NUMBER: VL70-000095

DIMENSIONS: (inches)	FULL-SCALE	.012 MODEL SCALE
Area (ft^2)	106.38	.0153
Span (equivalent)	201.0	2.412
Inb'd equivalent chord	91.585	1.099
Outb'd equivalent chord	50.833	0.610
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord	0.400	0.400
At Outb'd equiv. chord	0.400	0.400
Sweep Back Angles, degrees		
Leading Edge	34.83	34.83
Tailing Edge	26.25	26.25
Hingeline	34.83	34.83
Area Moment (Normal to hinge line)-Ft^3	526.125	.00091

TABLE III. (CONTINUED)

MODEL COMPONENT: Vertical Tail

GENERAL DESCRIPTION: Centerline vertical tail double wedge airfoil with rounded leading edge.

Scale Model = .012

DRAWING NUMBER: VL70-000095

DIMENSIONS: (inches)	FULL-SCALE	.012 MODEL SCALE
Area (theo) ft.^{2}	413.25	.0595
Span (equivalent)	315.72	3.789
Inb'd equivalent chord	268.50	3.222
Outb'd equivalent chord	108.47	1.302
Ratio movable surface chord/ total surface chord		
At Inb'd equiv. chord		
At Outb'd equiv. chord		
Sweep Back Angles, degrees		
Leading Edge	45	45
Tailing Edge	26.249	26.249
Hingeline		
Area Moment (Normal to hinge line)		

TABLE III. (CONCLUDED)

MODEL COMPONENT: WING

GENERAL DESCRIPTION: Orbiter Configuration per Lines VL70-000093.

NOTE: (Dihedral angle is defined at the lower surface of the wing at the 75.33% element line projected into a plane perpendicular to the FRL).

SCALE MODEL - 0.012

DRAWING NUMBER: VL70-000093

DIMENSIONS: (inches)	FULL-SCALE	.012 MODEL SCALE
TOTAL DATA		
Area (ft^2)		
Planform	2690.00	.3874
Wetted	-------	-------
Span (equivalent)	936.68	11.24
Aspect Ratio	2.265	2.265
Rate of Taper	1.177	1.177
Taper Ratio	0.200	0.200
Diehedral Angle, degrees	3.500	3.500
Incidence Angle, degrees	3.000	3.000
Aerodynamic Twist, degrees	+3.000	+3.000
Toe-In Angle		
Cant Angle		
Sweep Back Angles, degrees		
Leading Edge	45.000	45.000
Trailing Edge	-10.24	-10.24
0.25 Element Line	35.209	35.209
Chords:		
Root (Wing Sta. 0.0)	689.24	8.271
Tip, (equivalent)	137.85	1.654
MAC, inches	474.81	5.698
Fus. Sta. of .25 MAC	1136.89	13.643
W.P. of .25 MAC	299.20	3.590
Airfoil Section		
Root		
Tip		
EXPOSED DATA		
Area (ft)	1752.29	.2523
Span, (equivalent)	720.68	8.648
Aspect Ratio	2.058	2.058
Taper Ratio	0.2451	0.2451
Chords		
Root	562.40	6.749
Tip	137.85	1.654
MAC	393.03	4.716
Fus. Sta. of .25 MAC	1185.31	14.224
W.P. of .25 MAC	300.20	3.602
B.L. of .25 MAC	143.76	1.725

Notes:

1. Positive directions of force coefficients, moment coefficients, and angles are indicated by arrows
2. For clarity, origins of wind and stability axes have been displaced from the center of gravity

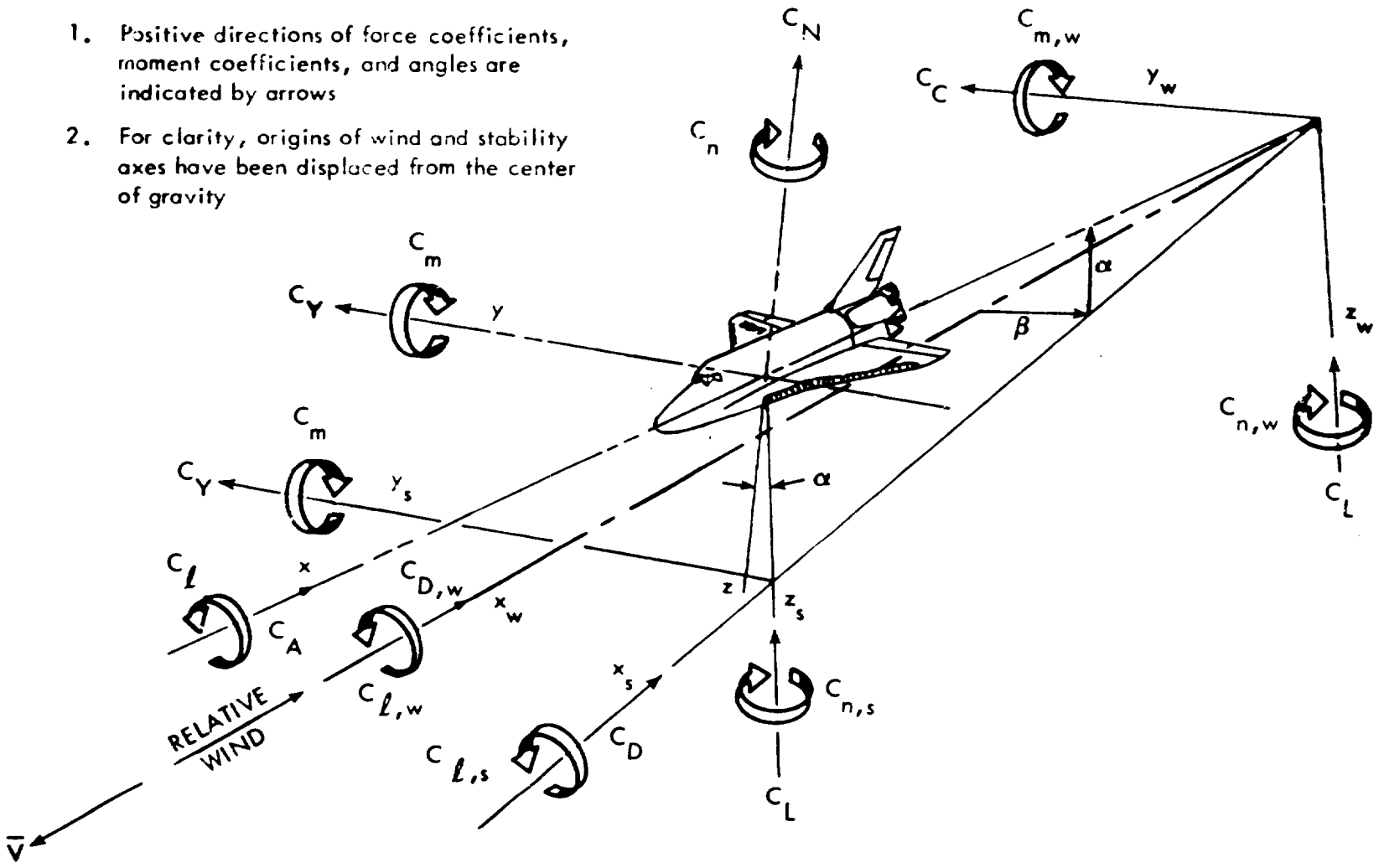
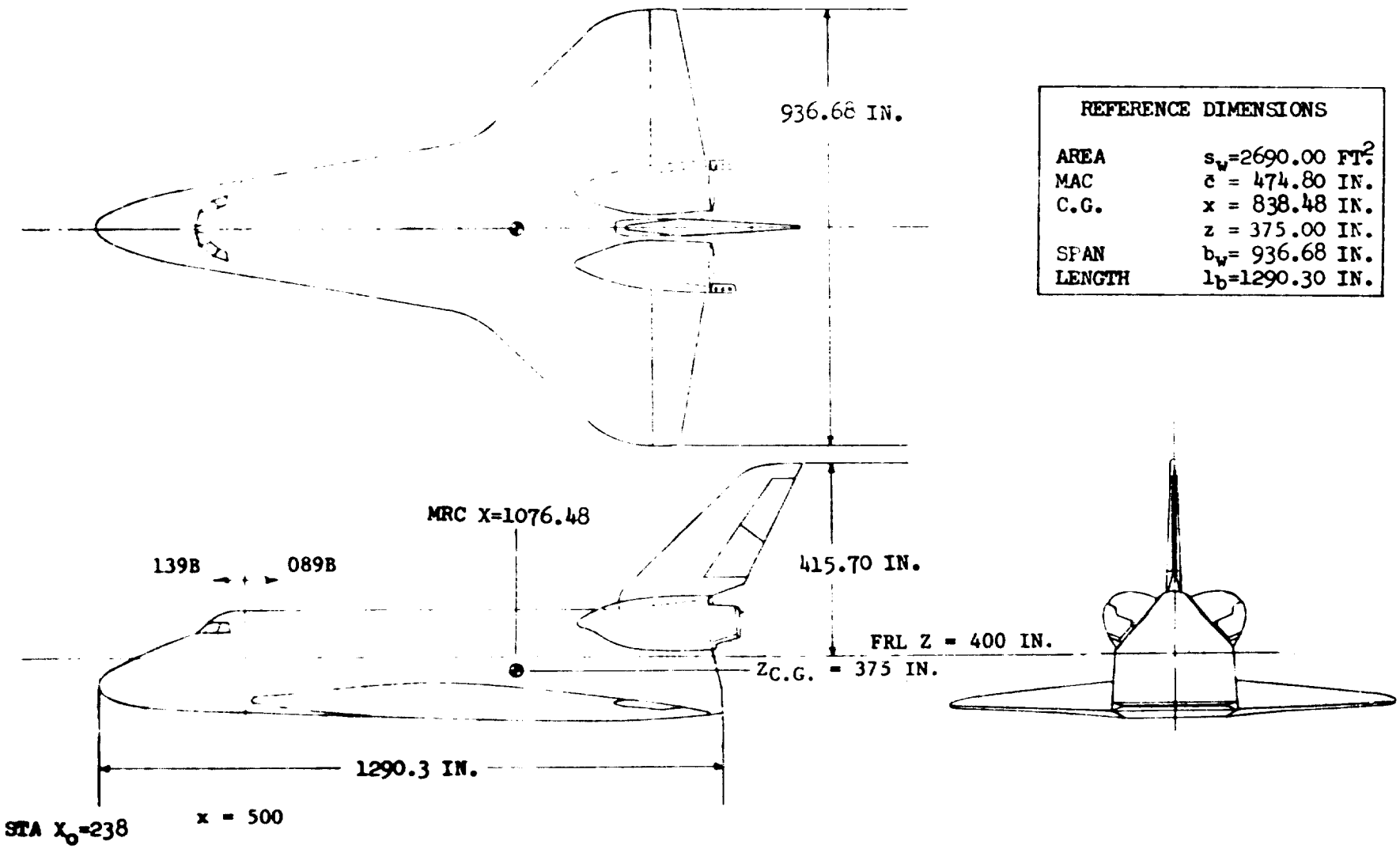
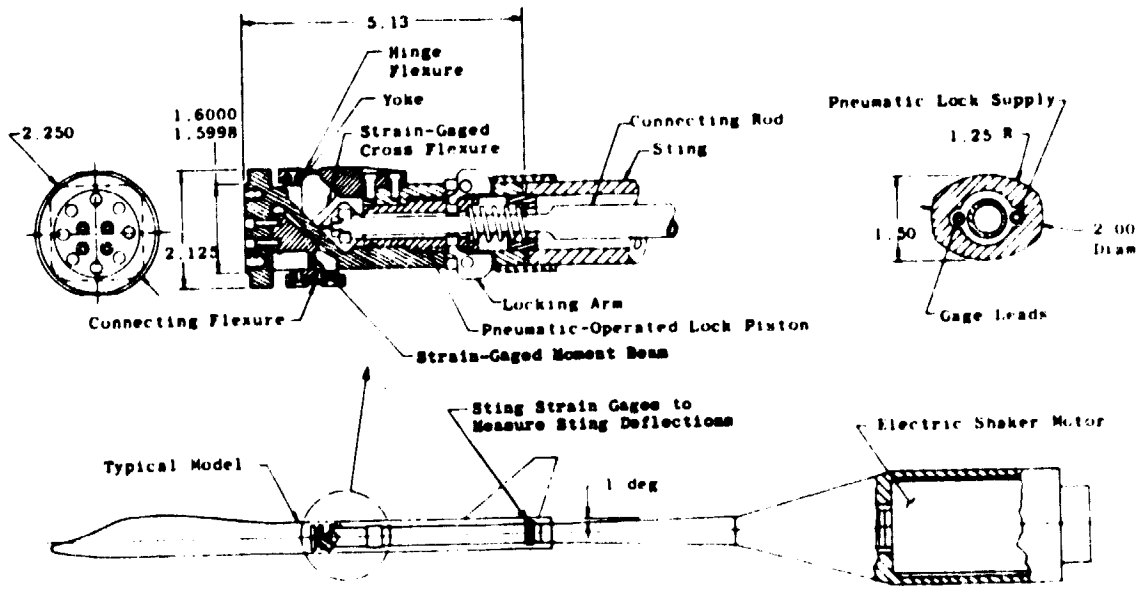


Figure 1. Axis System



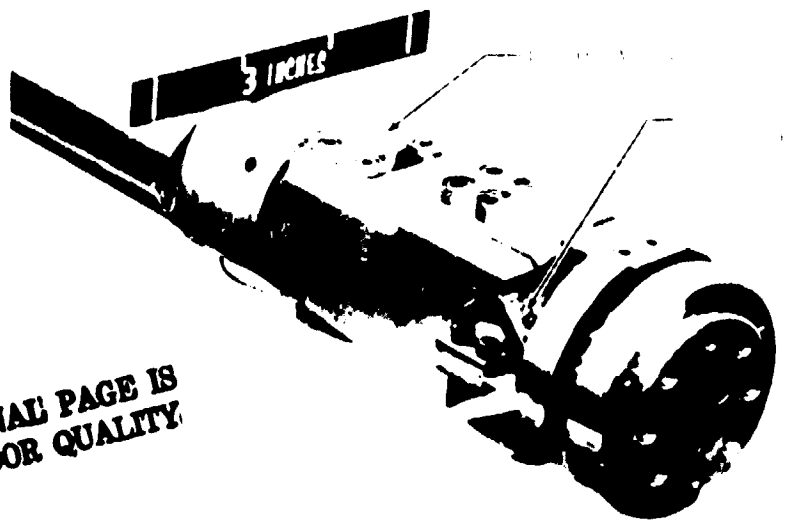
REFERENCE DIMENSIONS	
AREA	s_w=2690.00 FT^2.
MAC	$\bar{c}$ = 474.80 IN.
C.G.	x = 838.48 IN.
	z = 375.00 IN.
SPAN	b_w= 936.68 IN.
LENGTH	l_b=1290.30 IN.

Figure 2. - SSV Orbiter Configuration.



NOTE: Pitch Balance was supported by 1.75 in. diam water cooled sting (roll damping sting). Distance from pivot axis to sting flare was 26.7 in.

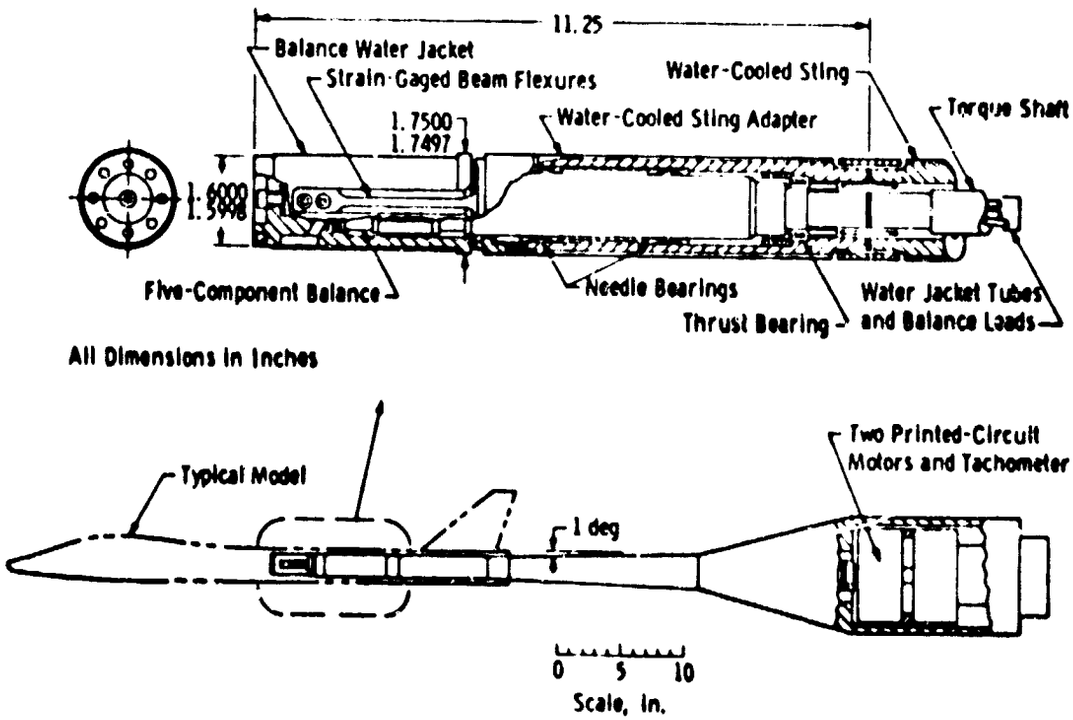
Details



Photograph of the Balance Assembly
VKF 1.B Test Mechanism

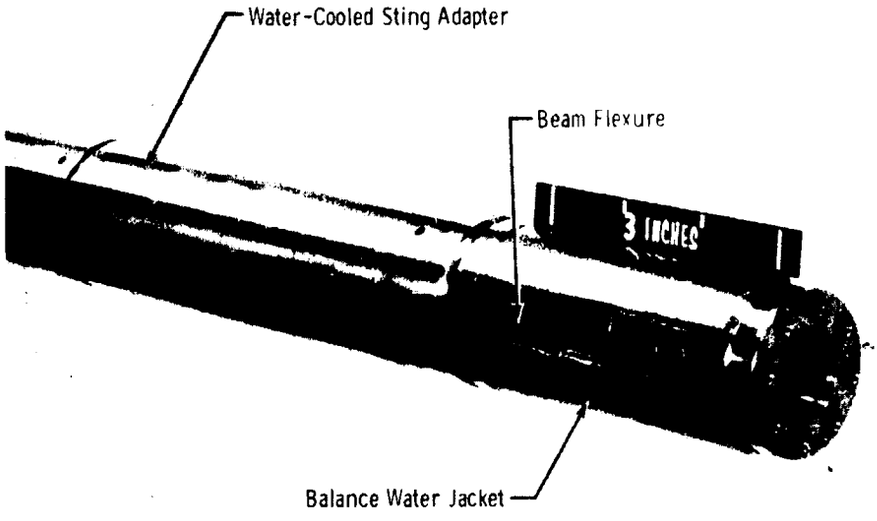
Figure 3a. Pitch/Yaw Balance Mechanism

Balance	Normal Force	Pitching Moment	Side Force	Yawing Moment	Rolling Moment
-59	500 lb	1125 in.-lb	40 lb	84 in.-lb	10 in.-lb
-60	1200 lb	2700 in.-lb	100 lb	210 in.-lb	100 in.-lb



Details
Test Mechanism

Figure 3b. Roll Balance Mechanism



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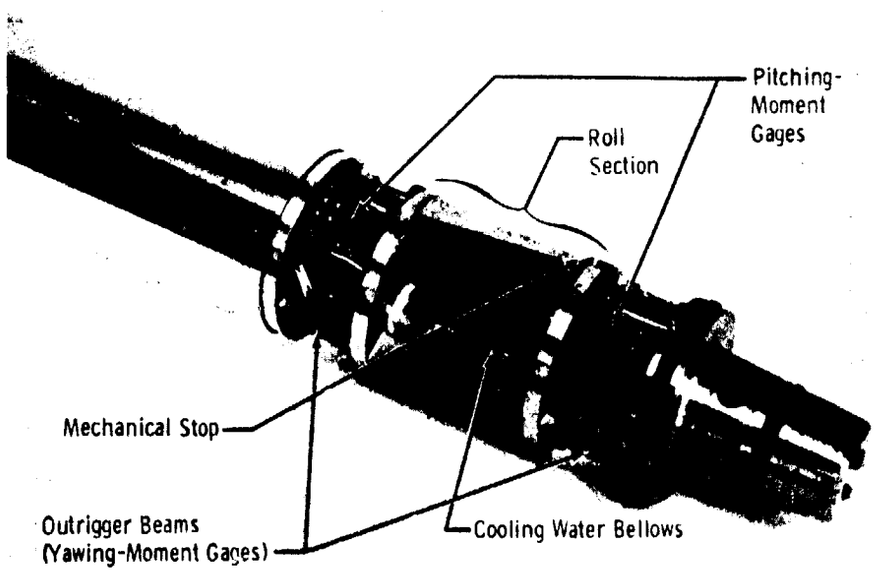
Photograph of the Flexures and Water Jacket



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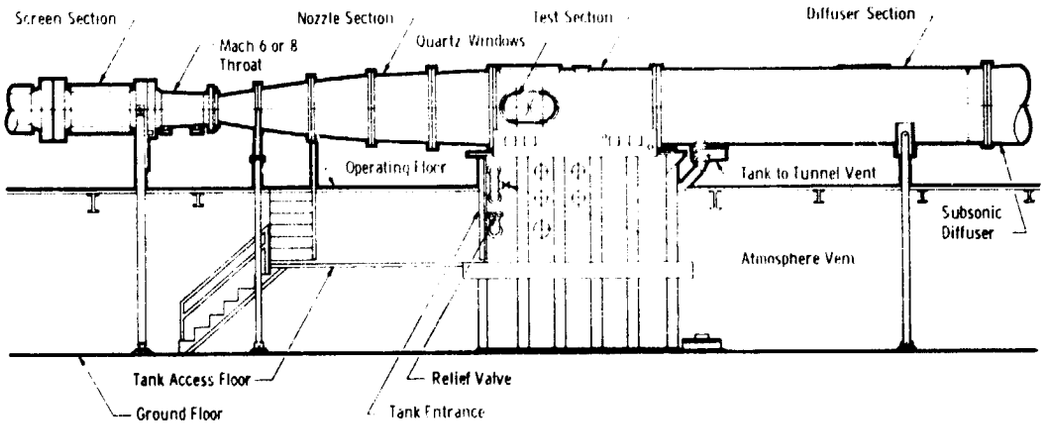
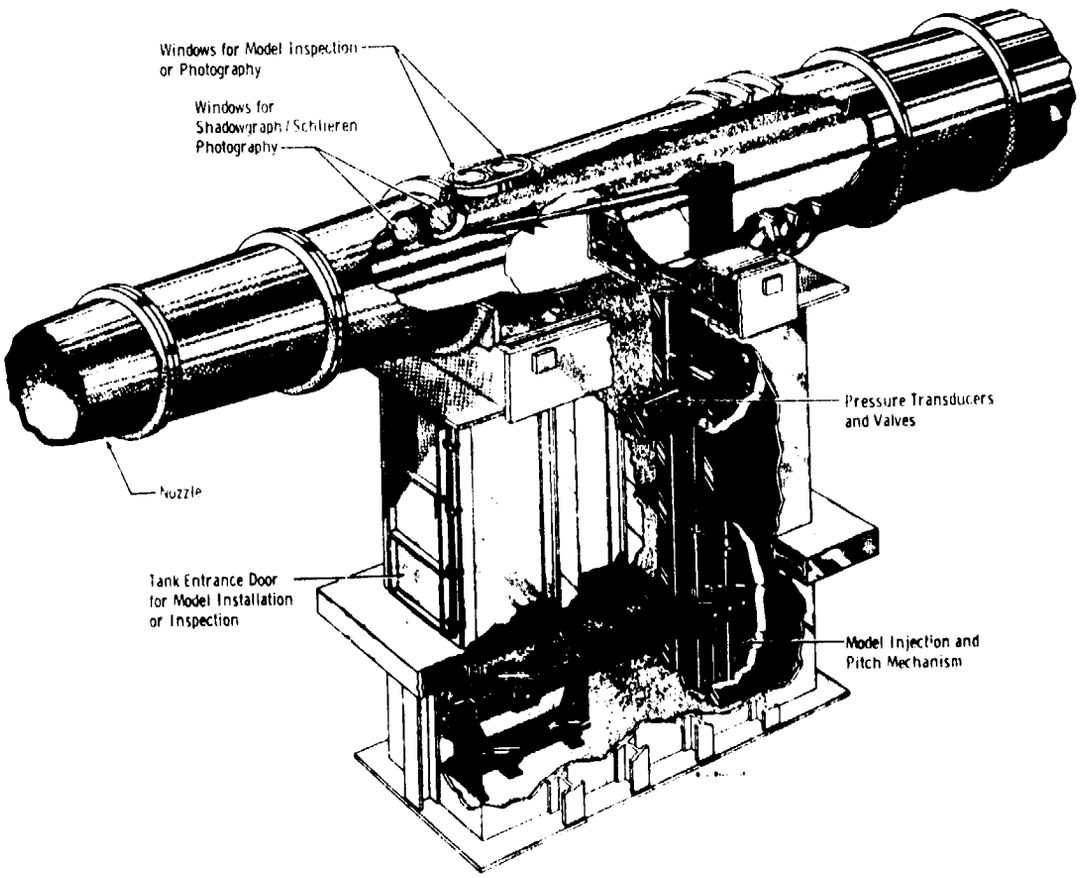
Photograph of the Balance

Figure 3c. Photograph of Roll Mechanism



a. Tunnel Assembly



b. Tunnel Test Section

Tunnel B

Figure 3d. AEDC VKF Tunnel B Depiction

DATA FIGURES

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	RN	BETA
[RTPP01]	□	AEDC-V41B-48A[LA-42] 0898 ORBITER	1.180	.000
[RTPP02]	◇	AEDC-V41B-48A[LA-42] 0898 ORBITER	2.360	.000
[RTPP03]	⊙	AEDC-V41B-48A[LA-42] 0898 ORBITER	4.820	.000

REFERENCE INFORMATION

SREF	2690.0000	SQ.FT.
LREF	474.8000	IN.
BREF	936.6000	IN.
XMRP	1076.7000	IN. XG
YMRP	.0000	IN. YG
ZMRP	375.0000	IN. ZG
SCALE	.0120	

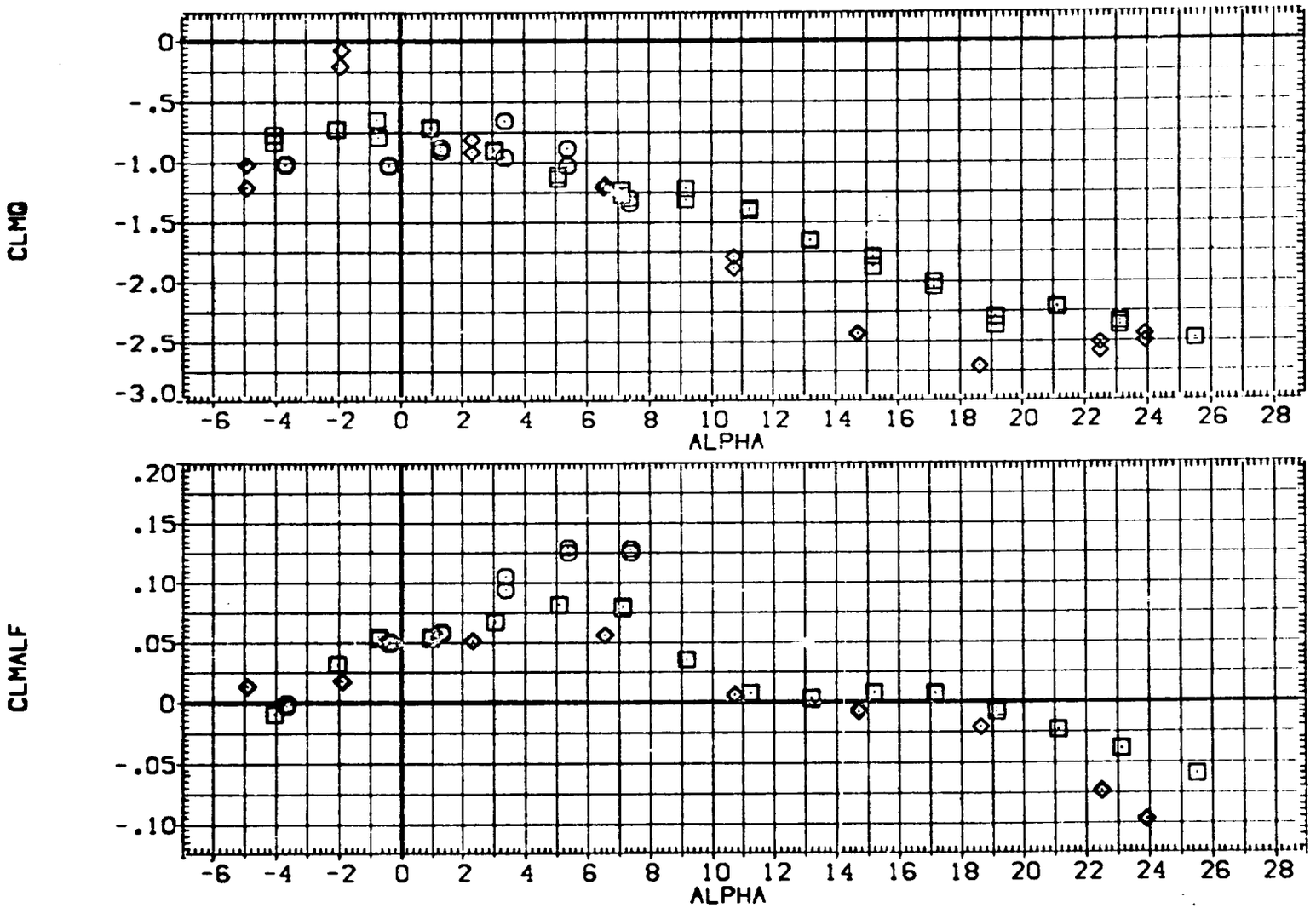


FIGURE 4 EFFECT OF REYNOLDS NUMBER ON DYNAMIC STABILITY IN PITCH

(A)MACH = 8.00

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	RN	BETA
(RTPRO1)	○	AEDC-V41B-48A(LA-42) 089B ORBITER	1.190	.000
(RTPRO2)	□	AEDC-V41B-48A(LA-42) 089B ORBITER	2.350	.000
(RTPRO3)	◇	AEDC-V41B-48A(LA-42) 089B ORBITER	4.720	.000

REFERENCE INFORMATION

SREF	2690.0000	SQ.FT.
LREF	474.8000	IN.
BREF	936.6800	IN.
XMRP	1076.7000	IN. XG
YMRP	.0000	IN. YG
ZMRP	375.0000	IN. ZG
SCALE	.0120	

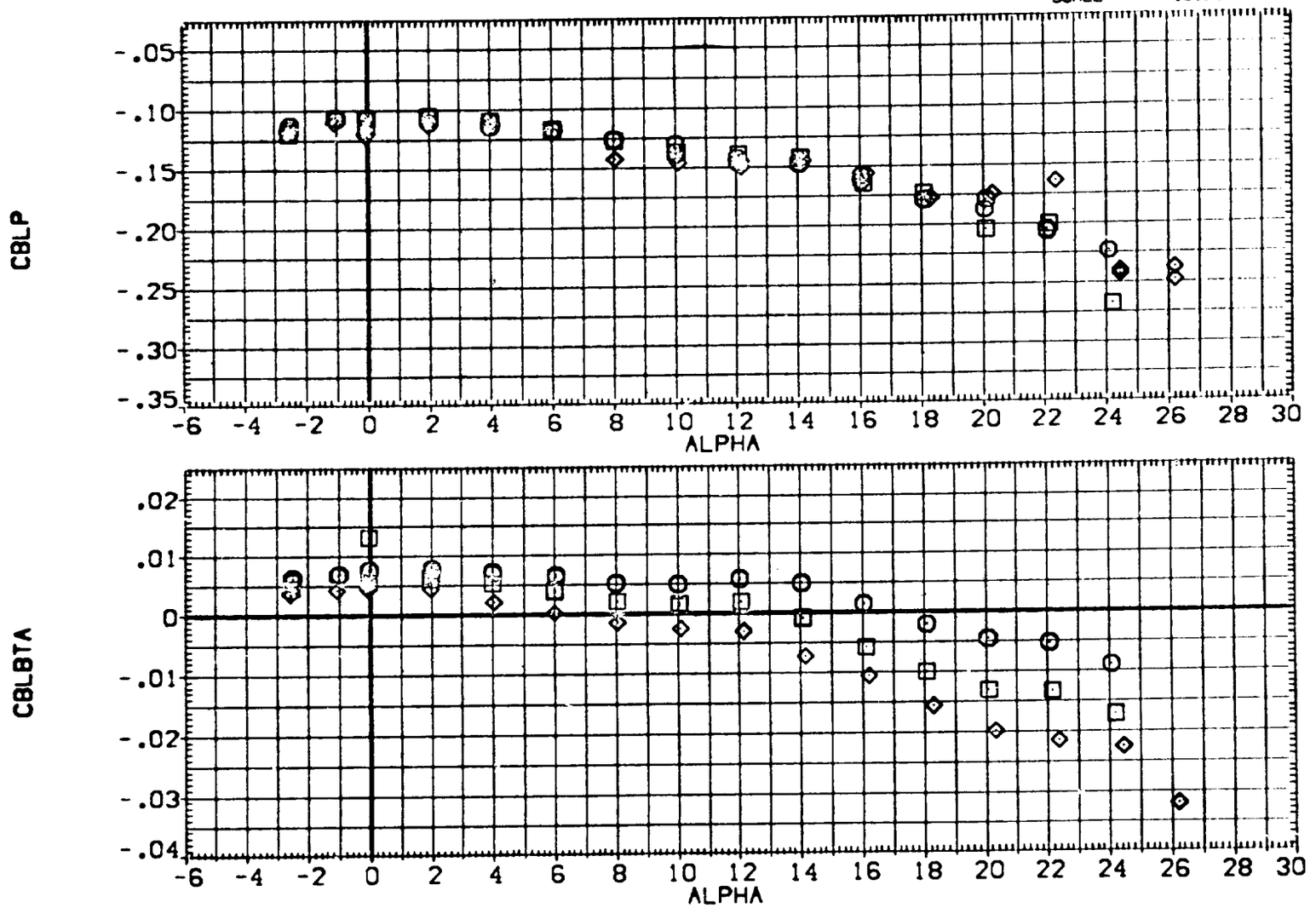


FIGURE 5 EFFECT OF REYNOLDS NUMBER ON DYNAMIC STABILITY IN ROLL

(A)MACH = 7.95

DATA SET SYMBOL	CONFIGURATION DESCRIPTION	RN	BETA
(RTPY02) ○	AEDC-V41B-48A(LA-42) 0898 ORBITER	2.370	.000
(RTPY04) □	AEDC-V41B-48A(LA-42) 0898 ORBITER LESS VERT.TAIL	2.370	.000

REFERENCE INFORMATION

SREF	2690.0000	SQ.FT.
LREF	474.8000	IN.
BREF	935.6900	IN.
XMRP	1076.7000	IN. XB
YMRP	.0000	IN. YB
ZMRP	375.0000	IN. ZB
SCALE	.0120	

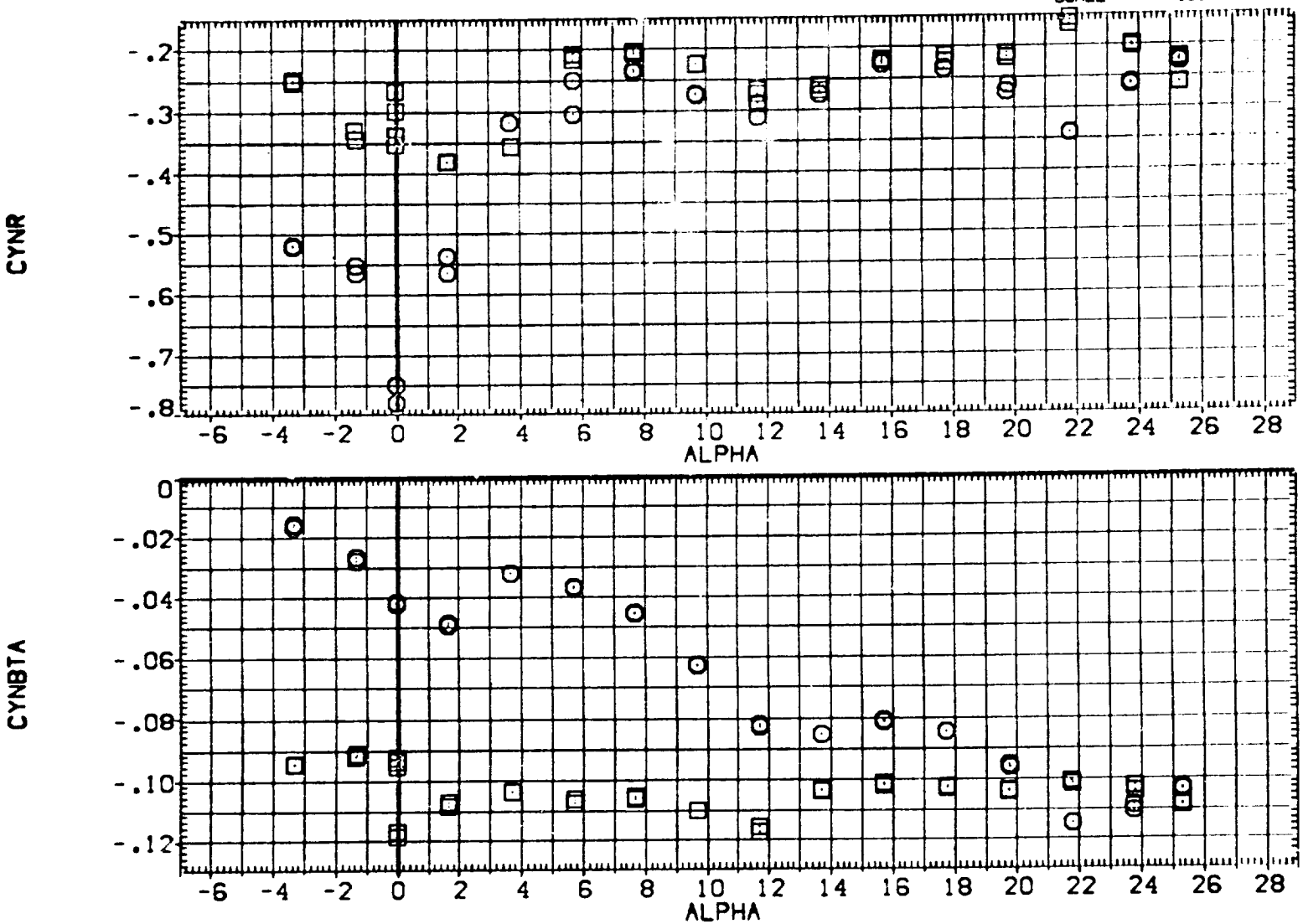


FIGURE 6 EFFECT OF VERTICAL TAIL ON DYNAMIC STABILITY IN YAW

(A)MACH = 8.00

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	RN	BETA
(RTPR02)	○	AEDC-V41B-48A(LA-42) 089B ORBITER	2.350	.000
(RTPR04)	□	AEDC-V41B-48A(LA-42) 093B ORBITER LESS VERT.TAIL	2.340	.000

REFERENCE INFORMATION

SREF	2690.0000	SQ.FT.
LREF	474.8000	IN.
BREF	936.6800	IN.
XMRP	1076.7000	IN. XB
YMRP	.0000	IN. YB
ZMRP	375.0000	IN. ZB
SCALE	.0120	

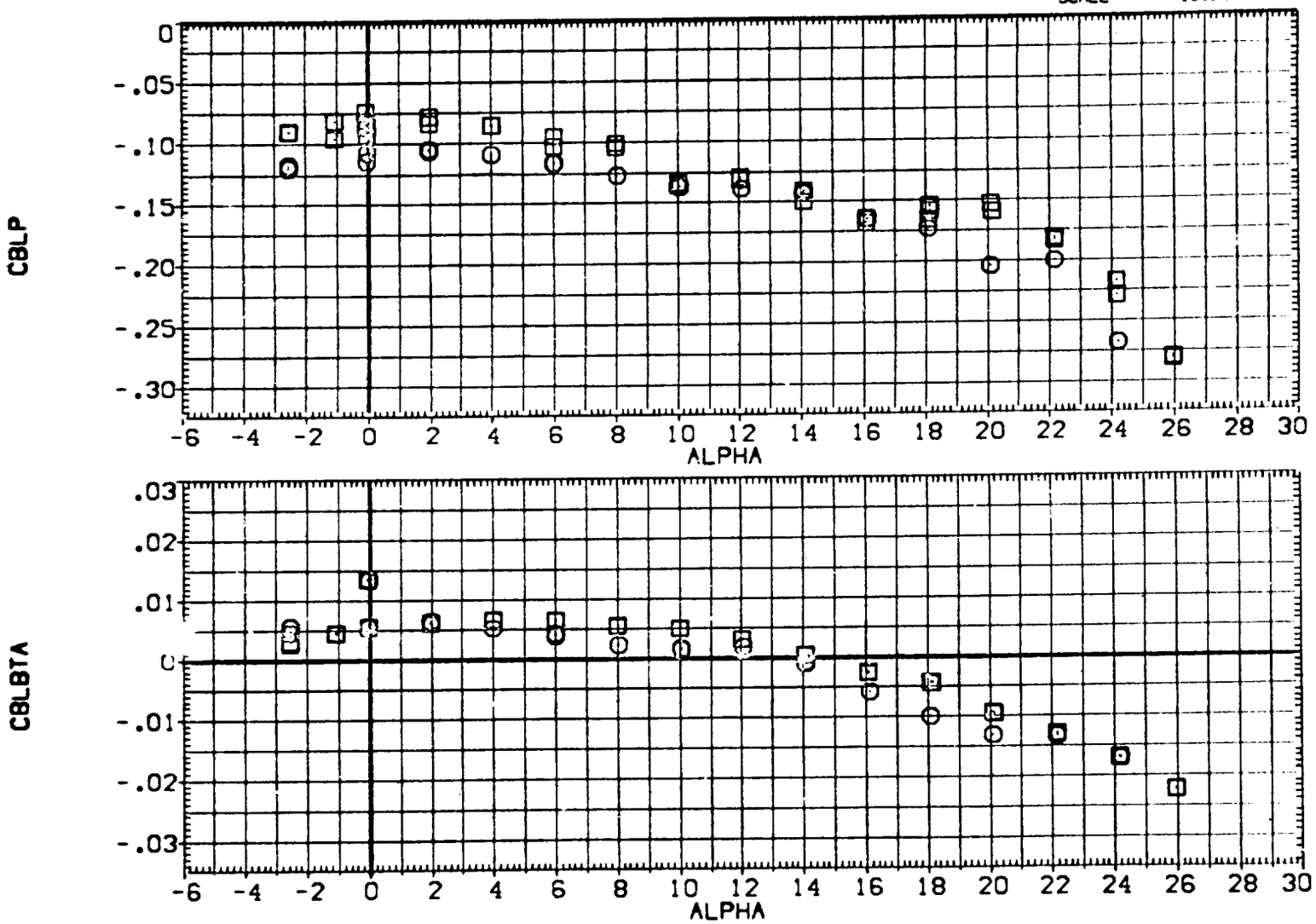


FIGURE 7 EFFECT OF VERTICAL TAIL ON DYNAMIC STABILITY IN ROLL (RN= 2.34)

(A)MACH = 7.98

DATA SET	SYMBOL	CONFIGURATION DESCRIPTION	RN	BETA
(RTPR03)	○	AEDC-V41B-48A(LA-42) 0898 ORBITER	4.720	.000
(RTPR05)	□	AEDC-V41B-48A(LA-42) 0898 ORBITER LESS VERT.TAIL	4.740	.000

REFERENCE INFORMATION

SREF	2690.0000	SQ.FT.
LREF	474.8000	IN.
BREF	936.6800	IN.
XMRP	1076.7000	IN. XB
YMRP	.0000	IN. YB
ZMRP	375.0000	IN. ZB
SCALE	.0120	

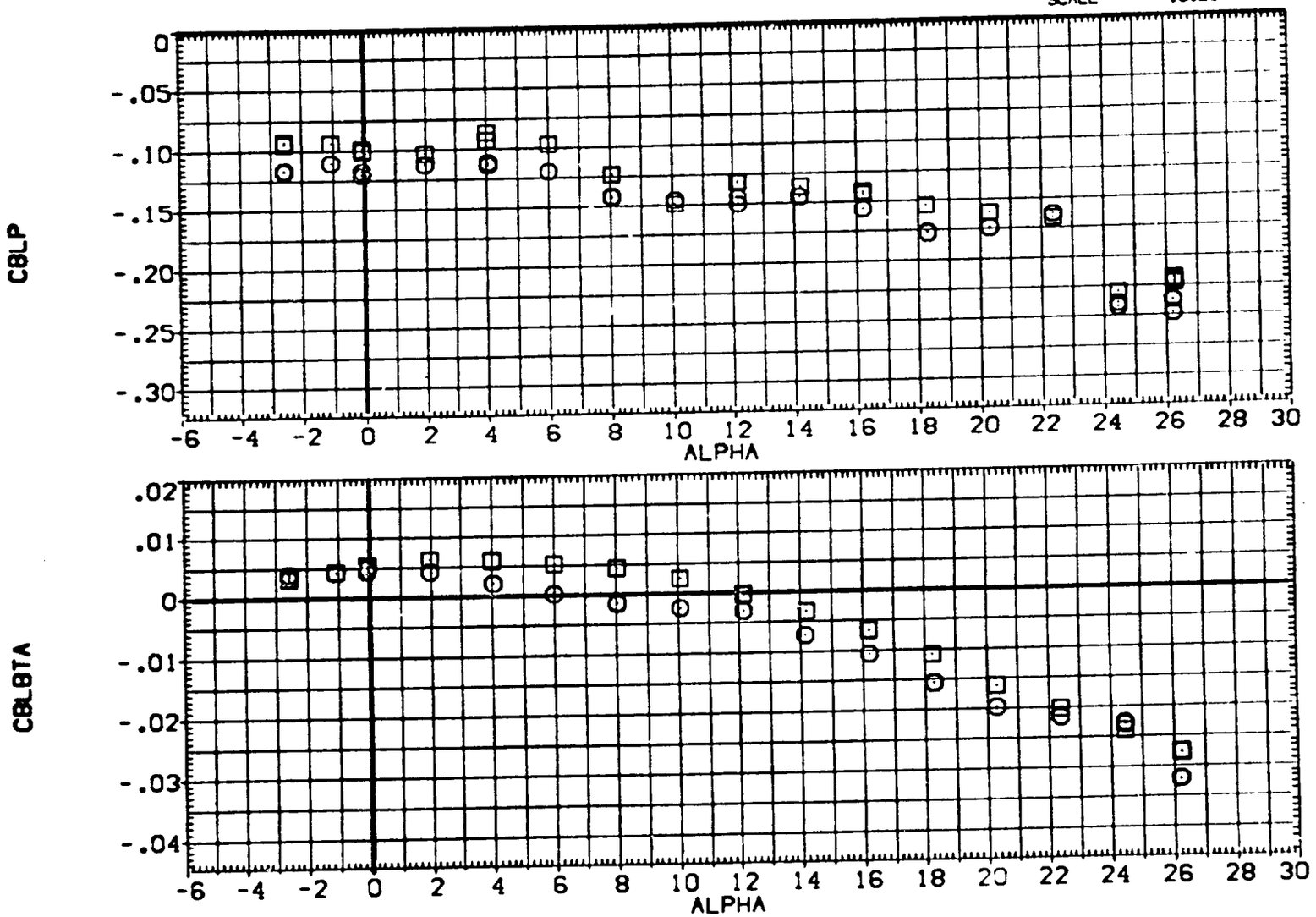


FIGURE 8 EFFECT OF VERTICAL TAIL ON DYNAMIC STABILITY IN ROLL (RN= 4.72)

(A)MACH = 8.00

APPENDIX

TABULATED SOURCE DATA

Tabulations of plotted data are available on request from Data Management Services.

AEDC-V41B-48A(LA-42) D89B ORBITER (RTFR01) (20 MAR 75)

REFERENCE DATA

SREF = 2680.0000 SQ.FT. XMRP = 1076.7000 IN. XO
LREF = 474.6000 IN. YMRP = .0000 IN. YO
BREF = 936.6000 IN. ZMRP = 375.0000 IN. ZO
SCALE = .0120

PARAMETRIC DATA

BETA = .000 RN = 1.190

RUN NO. 112/ 0 RN/L = 1.19 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CBLP	CBLBTA	CYNF	CYF	CN	CLM	CY	CYN	CBL
7.950	-2.520	-.11523	.00580	-.01808	.89620	-.07200	-.03231	.00104	-.00226	-.00023
7.950	-2.520	-.11242	.00625	-.02600	.40531	-.07190	-.03227	.00054	-.00236	-.00023
7.950	-1.020	-.10602	.00665	-.05727	-1.00889	-.04830	-.03087	-.00035	-.00237	-.00044
7.950	-1.010	-.10743	.00690	-.04808	-.44695	-.04820	-.03085	-.00053	-.00242	-.00044
7.950	-.020	-.10568	.00748	-.06339	-1.34216	-.03340	-.03026	-.00129	-.00254	-.00056
7.950	-.020	-.10601	.00774	-.06118	-1.09393	-.03340	-.03023	-.00147	-.00259	-.00056
7.950	2.000	-.10461	.00758	-.07391	-2.11087	-.00220	-.02901	-.00219	-.00258	-.00083
7.950	2.000	-.10997	.00791	-.02050	-.27366	-.00200	-.02838	-.00241	-.00262	-.00083
7.950	3.990	-.11393	.00696	-.01939	-.60808	.03260	-.02749	-.00342	-.00264	-.00107
7.950	3.990	-.10925	.00726	-.06524	-2.34705	.03290	-.02748	-.00349	-.00270	-.00107
7.950	6.020	-.11782	.00632	-.06324	-2.61528	.07030	-.02576	-.00443	-.00271	-.00127
7.950	6.020	-.11614	.00662	-.06027	-2.48809	.07010	-.02563	-.00467	-.00274	-.00127
7.950	8.000	-.12568	.00511	-.04520	-2.37546	.10990	-.02423	-.00528	-.00276	-.00144
7.950	8.000	-.12626	.00534	-.03859	-2.06795	.10990	-.02417	-.00537	-.00281	-.00144
7.950	10.020	-.13044	.00485	-.06415	-3.77341	.15840	-.02380	-.00639	-.00281	-.00159
7.950	10.020	-.13877	.00499	.01365	-.89682	.15850	-.02375	-.00649	-.00285	-.00158
7.950	12.020	-.14178	.00575	-.03137	-3.18950	.21150	-.02497	-.00720	-.00278	-.00177
7.950	12.020	-.14528	.00596	-.00303	-2.14119	.21170	-.02498	-.00739	-.00280	-.00177
7.950	14.050	-.14728	.00479	-.05545	-4.13906	.26820	-.02583	-.00818	-.00270	-.00196
7.950	14.050	-.14555	.00501	-.04762	-3.75560	.26830	-.02578	-.00824	-.00274	-.00196
7.950	16.030	-.15842	.00136	.11290	-4.51526	.32430	-.02489	-.01063	-.00223	-.00213
7.950	16.030	-.16207	.00155	.27820	-2.85538	.32470	-.02493	-.01067	-.00229	-.00214
7.950	18.080	-.17325	-.00217	-.21246	-4.16304	.37420	-.01989	-.01308	-.00187	-.00231
7.950	18.080	-.17829	-.00217	-.25912	-4.01780	.37420	-.01991	-.01296	-.00195	-.00231
7.950	20.070	-.18744	-.00460	-.22381	-5.31789	.44290	-.02003	-.01246	-.00210	-.00253
7.950	20.080	-.17947	-.00450	-.26022	-5.62661	.44330	-.02010	-.01259	-.00215	-.00254
7.950	22.070	-.20468	-.00549	-.27498	-4.68296	.51540	-.02190	-.01186	-.00236	-.00276
7.950	22.080	-.20672	-.00513	-.28908	-4.97734	.51600	-.02188	-.01191	-.00239	-.00277
7.950	24.080	-.22314	-.00905	-.29066	-4.62003	.59070	-.02422	-.01096	-.00268	-.00305
	GRADIENT	.00011	.00017	-.00163	-.27663	.01598	.00071	-.00064	-.00006	-.00013

AEDC-V41B-48A(LA-42) 089B ORBITER (RTPR02) (20 MAR 75)

REFERENCE DATA

SREF = 2690.0000 SQ.FT. XMRP = 1076.7000 IN. XO
LREF = 474.8000 IN. YMRP = .0000 IN. YO
BREF = 936.6800 IN. ZMRP = 375.0000 IN. ZO
SCALE = .0120

PARAMETRIC DATA

BETA = .000 RN = 2.350

RUN NO. 263/ 0 RN/L = 2.34 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CBLP	CBLBTA	CYNP	CYP	CN	CLM	CY	CYN	CBL
7.980	-2.550	-.11962	.00455	.04096	1.90688	-.07520	-.03309	.00115	-.00172	-.00007
7.980	-2.550	-.11770	.00573	.04142	1.85127	-.07560	-.03297	.00013	-.00193	-.00008
7.980	-.040	-.11456	.00568	-.00037	-.84230	-.03810	-.03104	-.00120	-.00188	-.00042
7.980	1.970	-.10458	.00599	-.01978	-1.24022	-.00550	-.02947	-.00219	-.00199	-.00067
7.980	1.960	-.10569	.00652	-.02444	-1.27616	-.00560	-.02942	-.00255	-.00209	-.00067
7.980	3.990	-.10913	.00522	-.01310	-1.47424	.02940	-.02764	-.00329	-.00205	-.00094
7.980	6.010	-.11691	.00378	-.00154	-2.14957	.06610	-.02560	-.00378	-.00200	-.00113
7.980	6.010	-.11697	.00409	-.00214	-2.15888	.06640	-.02558	-.00392	-.00206	-.00113
7.980	8.030	-.12606	.00222	.04109	-1.28142	.10790	-.02398	-.00447	-.00207	-.00129
7.980	10.040	-.13673	.00137	.09802	-2.75794	.15570	-.02284	-.00520	-.00191	-.00145
7.980	10.040	-.13619	.00160	.09756	-2.45435	.15600	-.02283	-.00536	-.00195	-.00146
7.980	12.050	-.13800	.00191	-.00480	-3.59299	.20110	-.02021	-.00635	-.00171	-.00167
7.980	14.060	-.14283	-.00139	-.05038	-4.09379	.25800	-.02054	-.00624	-.00170	-.00185
7.980	14.060	-.14179	-.00088	-.04339	-3.64568	.25860	-.02058	-.00643	-.00175	-.00186
7.980	16.110	-.16502	-.00579	-.07388	-3.54052	.32180	-.02116	-.00630	-.00178	-.00203
7.980	18.090	-.17257	-.01009	-.04259	-3.32040	.38460	-.02178	-.00622	-.00186	-.00223
7.980	20.120	-.20420	-.01320	-.05013	-4.57185	.45590	-.02297	-.00619	-.00181	-.00245
7.980	22.170	-.20052	-.01335	-.04179	-4.67913	.53210	-.02507	-.00613	-.00174	-.00271
7.980	24.190	-.26759	-.01711	.01468	-3.27849	.61250	-.02794	-.00595	-.00177	-.00300
7.980	-.030	-.10709	.01329	.02579	-.28348	-.03360	-.03077	-.00619	-.00335	-.00044
	GRADIENT	.00204	.00010	-.01020	-.56215	.01570	.00081	-.00062	-.00004	-.00013

AEDC-V41B-48A(LA-42) 0098 ORBITER (RTPR03) (20 MAR 75)

REFERENCE DATA

SREF = 2880.0000 SQ.FT. XMRP = 1076.7000 IN. XO
LREF = 474.6000 IN. YMRP = .0000 IN. YO
BREF = 936.6800 IN. ZMRP = 375.0000 IN. ZO
SCALE = .0120

PARAMETRIC DATA

BETA = .000 RN = 4.720

RUN NO. 236/ 0 RN/L = 4.72 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CBLP	CBLBTA	CYNP	CYP	CN	CLM	CY	CYN	CBL
8.000	-2.600	-.11692	.00349	.05596	1.38971	-.07480	-.03443	.00161	-.00147	-.00005
8.000	-2.600	-.11789	.00406	.07004	1.73597	-.07490	-.03445	.00103	-.00158	-.00006
8.000	-1.090	-.11031	.00414	.02800	-.28447	-.05220	-.03424	-.00017	-.00148	-.00030
8.000	-.080	-.11806	.00436	.02835	-.46920	-.03670	-.03290	-.00114	-.00147	-.00045
8.000	-.080	-.12078	.00480	.02001	-.73679	-.03700	-.03279	-.00140	-.00155	-.00045
8.000	1.960	-.11209	.00431	.03720	-.59767	-.00540	-.03025	-.00158	-.00153	-.00068
8.000	4.010	-.11327	.00210	.05276	-.52910	.03090	-.02810	-.00184	-.00150	-.00095
8.000	4.020	-.11096	.00219	.05055	-.80577	.03120	-.02804	-.00196	-.00152	-.00096
8.000	6.000	-.11972	.00028	.06399	-.86874	.06710	-.02605	-.00231	-.00140	-.00114
8.000	8.050	-.14168	-.00153	.12529	-.44663	.10710	-.02288	-.00264	-.00127	-.00132
8.000	8.060	-.14285	-.00147	.14777	-.25529	.10740	-.02281	-.00271	-.00127	-.00132
8.000	10.090	-.14530	-.00241	.04303	-1.63310	.15690	-.02169	-.00291	-.00111	-.00150
8.000	12.150	-.15007	-.00301	-.06518	-4.48976	.21460	-.02208	-.00303	-.00097	-.00171
8.000	12.150	-.14506	-.00300	-.08434	-4.99669	.21490	-.02207	-.00313	-.00098	-.00171
8.000	14.160	-.14507	-.00730	-.09764	-6.56666	.27180	-.02250	-.00305	-.00092	-.00186
8.000	16.220	-.15631	-.01068	-.00820	-4.80396	.33650	-.02328	-.00310	-.00079	-.00205
8.000	18.290	-.17746	-.01565	-.00269	-5.43089	.40740	-.02428	-.00308	-.00071	-.00223
8.000	18.290	-.17670	-.01558	.03953	-3.99358	.40760	-.02429	-.00315	-.00073	-.00223
8.000	20.330	-.17437	-.01991	.03749	-6.24119	.48070	-.02558	-.00306	-.00063	-.00244
8.000	22.370	-.16356	-.02145	.13285	-4.59837	.55710	-.02800	-.00298	-.00048	-.00267
8.000	24.440	-.24020	-.02260	.15661	-5.25688	.64000	-.03122	-.00263	-.00029	-.00300
8.000	24.440	-.24316	-.02264	.14924	-3.76403	.64050	-.03118	-.00274	-.00030	-.00301
8.000	26.220	-.24771	-.03192	.14961	-3.96321	.71990	-.03473	-.00205	-.00047	-.00315
8.000	25.220	-.23769	-.03214	.16498	-3.34963	.72090	-.03471	-.00213	-.00047	-.00316
	GRADIENT	.00375	-.00025	-.00053	-.28434	.01600	.00101	-.00046	.00000	-.00013

AEDC-V41B-48A(LA-42) 069B ORBITER LESS VERT.TAIL (RTPR04) (20 MAR 75)

REFERENCE DATA

SREF = 8000.0000 SQ.FT. XMRP = 1076.7000 IN. XO
LREF = 474.8000 IN. YMRP = .0000 IN. YO
BREF = 936.6800 IN. ZMRP = 375.0000 IN. ZO
SCALE = .1

PARAMETRIC DATA

BETA = .000 RN = 8.340

RUN NO. 148/ 9 RN/L = 2.33 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CBLP	CBLBTA	CYNP	CYP	CN	CLN	CY	CYR	CBL
7.980	-2.560	-.09022	.00282	.01281	1.39322	-.06320	-.04714	-.00149	-.00106	-.00070
7.980	-2.560	-.08893	.00309	.00848	1.18330	-.06310	-.04718	-.00168	-.00111	-.00071
7.980	-1.070	-.08133	.00439	-.02301	-.46799	-.04130	-.04493	-.00230	-.00122	-.00080
7.980	-1.070	-.09593	.00454	.02563	1.71330	-.04140	-.04491	-.00242	-.00126	-.00081
7.980	-.050	-.08662	.00539	-.00171	-.20091	-.02570	-.04334	-.00275	-.00135	-.00088
7.980	-.050	-.09298	.00558	.01266	.69386	-.02560	-.04331	-.00293	-.00139	-.00087
7.980	1.960	-.08306	.00599	-.01186	-.77135	.00470	-.04031	-.00302	-.00154	-.00104
7.980	1.960	-.07781	.00635	-.02761	-1.54656	.00470	-.04032	-.00312	-.00157	-.00104
7.980	3.970	-.08497	.00554	-.00412	-1.41826	.03870	-.03724	-.00362	-.00157	-.00124
7.980	3.970	-.08496	.00661	-.01672	-1.57313	.03870	-.03717	-.00369	-.00160	-.00123
7.980	5.990	-.10312	.00540	.03567	-.23297	.07550	-.03444	-.00392	-.00157	-.00139
7.980	5.990	-.09437	.00639	.00680	-1.42227	.07550	-.03438	-.00395	-.00158	-.00139
7.980	8.010	-.10362	.00552	.00936	-1.96547	.11640	-.03201	-.00419	-.00156	-.00154
7.980	8.010	-.10079	.00561	-.00782	-2.71288	.11650	-.03199	-.00430	-.00157	-.00154
7.980	10.010	-.13511	.00500	.22078	-1.40779	.16210	-.02974	-.00511	-.00145	-.00166
7.980	10.010	-.13500	.00511	.24667	-.93036	.16240	-.02978	-.00525	-.00145	-.00166
7.980	12.010	-.12863	.00306	.02402	-2.73446	.20410	-.02557	-.00613	-.00131	-.00181
7.980	12.010	-.13128	.00323	.04165	-2.46074	.20440	-.02563	-.00610	-.00135	-.00181
7.980	14.060	-.15010	.00036	.03113	-1.49196	.26450	-.02515	-.00591	-.00135	-.00197
7.980	14.060	-.14070	.00039	.00757	-2.60631	.26480	-.02515	-.00596	-.00138	-.00197
7.980	16.080	-.16820	-.00275	-.02096	-2.85734	.32670	-.02497	-.00559	-.00143	-.00214
7.980	16.080	-.16441	-.00250	-.04380	-3.05136	.32650	-.02489	-.00566	-.00145	-.00214
7.980	18.960	-.20105	-.02237	.07024	-3.51724	.68950	-.03290	-.00472	-.00174	-.00331
7.980	18.960	-.20125	-.02236	.06411	-2.96904	.68960	-.03288	-.00476	-.00175	-.00331
7.980	24.180	-.22956	-.01709	.04691	-2.99282	.61950	-.02979	-.00523	-.00189	-.00306
7.980	24.180	-.21814	-.01697	.02254	-3.72703	.61970	-.02978	-.00529	-.00190	-.00306
7.980	22.160	-.18135	-.01298	.00542	-3.68986	.54300	-.02719	-.00571	-.00202	-.00277
7.980	22.160	-.18389	-.01295	.00931	-3.61049	.54290	-.02720	-.00573	-.00202	-.00276
7.980	20.130	-.15909	-.00969	.03168	-2.99243	.47100	-.02569	-.00601	-.00214	-.00254
7.980	20.120	-.15316	-.00949	.00055	-3.62475	.47070	-.02569	-.00611	-.00212	-.00254
7.980	18.110	-.16530	-.00444	-.00219	-2.45416	.39870	-.02501	-.00662	-.00214	-.00232
7.980	18.120	-.15379	-.00435	-.06478	-3.43642	.39880	-.02506	-.00661	-.00215	-.00232
7.980	18.120	-.15617	-.00445	-.01388	-2.69503	.39860	-.02507	-.00667	-.00213	-.00232
7.980	18.120	-.15494	-.00440	-.03994	-3.01754	.39810	-.02507	-.00672	-.00212	-.00231
7.980	-.070	-.07414	.01345	.01020	-.22322	-.02320	-.04268	-.00674	-.00265	-.00386
7.980	-.070	-.08258	.01356	.03786	1.03244	-.02320	-.04275	-.00675	-.00264	-.00386
	GRADIENT	.00109	.00053	-.00393	-.45499	.01556	.00152	-.00029	-.00008	-.00008

AEDC-V41B-48A(LA-42) D89B ORBITER LESS VERT.TAIL (RTPROS) (20 MAR 75)

REFERENCE DATA

PARAMETRIC DATA

SREF = 2686.0000 SQ.FT. XMRP = 1076.7000 IN. XO
LREF = 474.8000 IN. YMRP = .0000 IN. YO
BREF = 936.6800 IN. ZMRP = 375.0000 IN. ZO
SCALE = .0120

BETA = .000 RN = 4.740

RUN NO. 201/ 0 RN/L = 4.72 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CBLP	CBLBTA	CYNP	CYP	CN	CLM	CY	CYN	CBL
0.000	-2.000	-.09208	.00327	.02258	1.66227	-.06640	-.04783	-.00304	-.00132	-.00075
0.000	-2.000	-.09422	.00329	.02998	1.90373	-.06650	-.04782	-.00316	-.00134	-.00075
0.000	-1.070	-.09364	.00445	.00287	.43559	-.04320	-.04595	-.00385	-.00137	-.00088
0.000	-.070	-.09884	.00527	-.00110	.01790	-.02910	-.04407	-.00391	-.00142	-.00095
0.000	-.090	-.10384	.00546	-.01611	-.49169	-.02910	-.04405	-.00423	-.00147	-.00095
0.000	1.960	-.10248	.00627	.02825	.62990	.00120	-.04007	-.00378	-.00156	-.00109
0.000	3.980	-.09248	.00598	.03584	.15081	.03560	-.03666	-.00345	-.00158	-.00131
0.000	3.980	-.0966.	.00607	.01825	-.41677	.03600	-.03662	-.00391	-.00160	-.00131
0.000	6.000	-.09634	.00532	.02994	-.74354	.07260	-.03392	-.00400	-.00151	-.00147
0.000	8.050	-.12433	.00444	.11481	.37510	.11180	-.02987	-.00426	-.00138	-.00165
0.000	8.050	-.12238	.00451	.10916	.28224	.11210	-.02985	-.00432	-.00138	-.00165
0.000	10.080	-.14933	.00252	.10609	.14935	.16100	-.02790	-.00426	-.00126	-.00179
0.000	12.130	-.13078	-.00032	-.06121	-3.35174	.21700	-.02707	-.00396	-.00121	-.00195
0.000	12.150	-.13215	-.00025	-.05878	-3.19294	.21750	-.02705	-.00404	-.00121	-.00195
0.000	14.180	-.13657	-.00332	-.06337	-3.85734	.27640	-.02654	-.00363	-.00116	-.00210
0.000	16.210	-.14116	-.00673	-.03507	-4.26359	.33470	-.02643	-.00325	-.00111	-.00224
0.000	16.210	-.14361	-.00664	-.02797	-4.04114	.33900	-.02642	-.00331	-.00113	-.00224
0.000	18.260	-.15386	-.01080	-.01953	-4.79699	.40520	-.02676	-.00294	-.00112	-.00239
0.000	20.320	-.15137	-.01620	-.03470	-7.31995	.47950	-.02755	-.00250	-.00108	-.00260
0.000	22.380	-.16709	-.02032	.12220	-2.97710	.55780	-.02938	-.00221	-.00095	-.00280
0.000	24.440	-.23071	-.02394	.12147	-2.34962	.63800	-.03211	-.00163	-.00081	-.00306
0.000	26.240	-.22034	-.02784	.14017	-3.38436	.71730	-.03542	-.00123	-.00078	-.00333
0.000	26.240	-.21923	-.02779	.14051	-3.29441	.71850	-.03544	-.00128	-.00080	-.00334
0.000	26.240	-.22203	-.02772	.15991	-2.91863	.71920	-.03546	-.00134	-.00081	-.00334
0.000	26.240	-.22319	-.02771	.15932	-2.68283	.71930	-.03545	-.00135	-.00081	-.00334
	GRADIENT	.00039	.00041	.00164	-.23055	.01549	.00173	-.00010	-.00004	-.00008

AEDC-V41B-48A(LA-42) 089B ORBITER (RTFPD1) (06 NOV 74)

REFERENCE DATA

SREF = 2690.0000 SQ.FT. XMRP = 1076.7000 IN. XO
LREF = 474.8000 IN. YMRP = .0000 IN. YO
BREF = 936.6800 IN. ZMRP = 375.0000 IN. ZO
SCALE = .0120

PARAMETRIC DATA

BETA = .000 RN = 1.180

RUN NO. 137 D RN/L = .92 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CLM0	CLMALF	CLM
8.000	-3.670	-1.02200	-.00290	-.03370
8.000	-3.670	-1.00900	-.00160	-.03370
8.000	-.370	-1.02700	.04950	-.03230
8.000	-.370	-1.02100	.05070	-.03220
8.000	1.330	-.90300	.05780	-.03050
8.000	1.320	-.87300	.05980	-.03060
8.000	3.350	-.95900	.09390	-.02940
8.000	3.350	-.65800	.10550	-.02940
8.000	5.380	-.88900	.12960	-.02770
8.000	5.380	-1.03300	.12540	-.02770
8.000	7.400	-1.33900	.12490	-.02610
8.000	7.400	-1.30100	.12870	-.02610
	GRADIENT	.03073	.01393	.00063

AEDC-V41B-48A(LA-42) 089B ORBITER (RTPP02) (06 NOV 74)

REFERENCE DATA

SREF = 2690.0000 SQ.FT. XMRP = 1076.7000 IN. XO
LREF = 474.8000 IN. YMRP = .0000 IN. YO
BREF = 936.6800 IN. ZMRP = 375.0000 IN. ZO
SCALE = .0120

PARAMETRIC DATA

BETA = .000 RN = 2.360

RUN NO. 28/ 0 RN/L = 1.83 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CLMQ	CLMALF	CLM
7.950	-4.050	-.83300	-.01000	-.03340
7.950	-4.050	-.77100	-.00910	-.03340
7.950	-2.050	-.73000	.03110	-.03320
7.950	-2.060	-.71300	.03230	-.03320
7.950	-.720	-.78600	.05330	-.03240
7.950	-.740	-.64800	.05500	-.03240
7.950	.980	-.70500	.05300	-.03130
7.950	.980	-.71800	.05480	-.03130
7.950	3.040	-.90500	.06720	-.02980
7.950	3.040	-.89000	.06810	-.02980
7.950	5.070	-1.10600	.08130	-.02780
7.950	5.070	-1.13000	.08140	-.02780
7.950	7.140	-1.27500	.07860	-.02570
7.950	7.140	-1.22600	.07990	-.02570
7.950	9.160	-1.31900	.03530	-.02380
7.950	9.170	-1.21900	.03520	-.02370
7.950	11.210	-1.40200	.00730	-.02320
7.950	11.210	-1.38900	.00730	-.02310
7.950	13.200	-1.64500	.00190	-.02370
7.950	13.200	-1.65700	.00320	-.02370
7.950	15.200	-1.79600	.00720	-.02450
7.950	15.210	-1.87900	.00730	-.02450
7.950	17.160	-2.00400	.00570	-.02540
7.950	17.170	-2.04300	.00680	-.02540
7.950	19.160	-2.36300	-.00800	-.02660
7.950	19.160	-2.29300	-.00530	-.02670
7.950	21.130	-2.21600	-.02300	-.02840
7.950	21.130	-2.22100	-.02340	-.02840
7.950	23.100	-2.37000	-.03880	-.03080
7.950	23.100	-2.33800	-.03830	-.03080
7.950	25.520	-2.48600	-.05980	-.03480
	GRADIENT	-.01140	.01020	.00053

AEDC-V41B-48A(LA-42) 089B ORBITER (RTPP03) (06 NOV 74)

REFERENCE DATA

SREF = 2690.0000 SQ.FT. XMRP = 1076.7000 IN. XO
LREF = 474.8000 IN. YMRP = .0000 IN. YO
BREF = 936.6800 IN. ZMRP = 375.0000 IN. ZO
SCALE = .0120

PARAMETRIC DATA

BETA = .000 RN = 4.820

RUN NO. 61/ 0 RN/L = 3.73 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CLMQ	CLMALF	CLM
8.000	-4.910	-1.02400	.01290	-.03520
8.000	-4.910	-1.20300	.01370	-.03520
8.000	-1.890	-.07000	.01710	-.03490
8.000	-1.900	-.20300	.01750	-.03490
8.000	2.330	-.81300	.05150	-.03030
8.000	2.330	-.91900	.05220	-.03030
8.000	6.560	-1.20700	.05600	-.02590
8.000	6.570	-1.18800	.05670	-.02580
8.000	10.710	-1.78800	.00520	-.02360
8.000	10.710	-1.88400	.00570	-.02360
8.000	14.700	-2.43400	-.00810	-.02480
8.000	14.700	-2.44000	-.00690	-.02480
8.000	18.630	-2.71700	-.02090	-.02700
8.000	22.500	-2.51400	-.07430	-.03110
8.000	22.500	-2.58900	-.07340	-.03110
8.000	23.900	-2.50100	-.09750	-.03370
8.000	23.900	-2.44300	-.09740	-.03370
	GRADIENT	.02087	.00551	.00070

DATE 04 APR 75 TABULATED SOURCE DATA - LA42

AEDC-V41B-48A(LA-42) 0898 ORBITER (RTFY02) (06 NOV 74)

REFERENCE DATA

PARAMETRIC DATA

SREF = 2690.0000 SQ.FT. XMRP = 1076.7000 IN. XO
LREF = 474.8000 IN. YMRP = .0000 IN. YO
BREF = 936.6800 IN. ZMRP = 375.0000 IN. ZO
SCALE = .0120

BETA = .000 RN = 2.370

RUN NO. 80/ 0 RN/L = 1.82 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CYNR	CYNBTA	CY...
8.000	-3.340	-.51800	-.01580	.00060
8.000	-3.340	-.52100	-.01660	.00060
8.000	-1.340	-.56400	-.02640	.00040
8.000	-1.340	-.55300	-.02800	.00040
8.000	-.040	-.78100	-.04160	.00030
8.000	-.040	-.75000	-.04240	.00030
8.000	1.660	-.56400	-.04880	.00020
8.000	1.660	-.53800	-.04950	.00020
8.000	3.640	-.31600	-.03180	.00010
8.000	5.710	-.30400	-.03640	.00000
8.000	5.710	-.25000	-.03710	.00000
8.000	7.680	-.23300	-.04520	.00000
8.000	7.680	-.23600	-.04570	.00000
8.000	9.690	-.27200	-.06270	-.00010
8.000	9.690	-.27500	-.06280	-.00010
8.000	11.680	-.31000	-.08260	-.00030
8.000	11.700	-.28800	-.08340	-.00030
8.000	13.710	-.27500	-.08600	-.00040
8.000	15.720	-.22500	-.08120	-.00060
8.000	15.720	-.22600	-.08160	-.00060
8.000	17.730	-.23500	-.08500	-.00080
8.000	19.740	-.27200	-.09600	-.00090
8.000	19.750	-.26200	-.09680	-.00090
8.000	23.760	-.25300	-.10940	-.00120
8.000	23.750	-.25100	-.11060	-.00120
8.000	25.290	-.22400	-.10400	-.00120
8.000	25.290	-.22700	-.10430	-.00120
8.000	21.750	-.33900	-.11510	-.00110
	GRADIENT	.01460	-.00403	-.00007

AEDC-V41B-48A(LA-42) 089B ORBITER LESS VERT.TAIL (RTPY04) (06 NOV 74)

REFERENCE DATA

SREF = 2680.0000 SQ.FT. XMRP = 1076.7000 IN. XO
LREF = 474.8000 IN. YMRP = .0000 IN. YO
BREF = 936.6800 IN. ZMRP = 375.0000 IN. ZO
SCALE = .0120

PARAMETRIC DATA

BETA = .000 RN = 2.370

RUN NO. 112/ 0 RN/L = 1.83 GRADIENT INTERVAL = -5.00/ 5.00

MACH	ALPHA	CYNR	CYNBTA	CYN
8.000	-3.350	-.25200	-.09490	-.00070
8.000	-3.350	-.24700	-.09520	-.00070
8.000	-1.330	-.34300	-.09180	-.00070
8.000	-1.350	-.32800	-.09240	-.00070
8.000	-.040	-.29800	-.09280	-.00070
8.000	-.050	-.26500	-.09410	-.00070
8.000	-.050	-.35200	-.09610	-.00070
8.000	1.650	-.38100	-.10770	-.00060
8.000	1.650	-.37900	-.10870	-.00060
8.000	3.700	-.35500	-.10420	-.00060
8.000	5.700	-.21500	-.10690	-.00060
8.000	5.710	-.20800	-.10790	-.00060
8.000	7.690	-.20300	-.10610	-.00060
8.000	7.690	-.20800	-.10700	-.00060
8.000	9.690	-.22400	-.11050	-.00060
8.000	11.710	-.26700	-.11590	-.00060
8.000	11.710	-.27300	-.11750	-.00060
8.000	13.710	-.25900	-.10370	-.00060
8.000	13.710	-.26900	-.10440	-.00060
8.000	15.730	-.22100	-.10190	-.00070
8.000	15.730	-.22100	-.10270	-.00070
8.000	17.760	-.22500	-.10300	-.00080
8.000	17.760	-.21400	-.10360	-.00080
8.000	19.730	-.21100	-.10410	-.00080
8.000	19.730	-.21800	-.10460	-.00090
8.000	21.750	-.16300	-.10150	-.00090
8.000	21.760	-.15400	-.10230	-.00090
8.000	23.790	-.19800	-.10320	-.00110
8.000	23.790	-.20100	-.10480	-.00110
8.000	25.280	-.26000	-.10880	-.00120
8.000	25.280	-.22100	-.10940	-.00120
8.000	-.050	-.33700	-.11730	-.00090
8.000	-.040	-.33800	-.11880	-.00090
	GRADIENT	-.01707	-.00207	.00002